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MOTORTRUCK OPERATING COSTS OF FARMER COOPERATIVES

FARMER COOPERATIVE SERVICE • U.S. DEPARTMENT OF AGRICULTURE

Farmer Cooperative Service
U.S. Department of Agriculture
Washington, D.C., 20250

Joseph G. Knapp, Administrator

The Farmer Cooperative Service conducts research studies and service activities of assistance to farmers in connection with cooperatives engaged in marketing farm products, purchasing farm supplies, and supplying business services. The work of the Service relates to problems of management, organization, policies, merchandising, product quality, costs, efficiency, financing, and membership.

The Service publishes the results of such studies; confers and advises with officials of farmer cooperatives; and works with educational agencies, cooperatives, and others in the dissemination of information relating to cooperative principles and practices.

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Highlights

This report gives results of a detailed study of motortruck operating costs of 20 farmer cooperatives.

Nineteen of these cooperatives spent over $100 million on transportation in 1962. Operation of their own trucks accounted for 12 percent of this amount, with expenditures on for-hire motortruck and rail transportation amounting to 86 percent of the total.

The 20 cooperatives providing motortruck operating cost information for this study operated 533 truck-tractors, 123 straight trucks, and 832 trailers and semitrailers. The average size fleet was 33 trucks.

The 656 truck-tractors and straight trucks operated by the 20 cooperatives traveled over 38 million miles in 1962. The average round trip, reported by 18 cooperatives, was 178.4 miles.

Each truck averaged 58,100 miles during the year. Pickups per trip averaged 1.9 and stopoffs 6.1. The average miles per gallon of fuel was 5.5.

Total operating costs for this fleet amounted to almost $13 3/4 million in 1962, or an average of 36 cents a mile operated.

Eleven of the 20 cooperatives had motortruck operating costs that averaged between 30 and 39.9 cents a mile.

Direct costs amounted to 25.6 cents a mile, or 71 percent of total operating costs, followed by 19 percent for overhead and 10 percent for indirect costs. Drivers' wages were the largest expense item, accounting for 13 cents a mile, or over 50 percent of direct costs.

Depreciation of motortrucks and facilities was the largest overhead cost item, amounting to 3.7 cents a mile, or 55 percent of total overhead costs. Office and garage salaries and wages accounted for 3.3 cents a mile, or almost 89 percent of total indirect costs.

Information obtained from 18 of the 20 cooperatives showed they had backhauls for only 46,627--or 21.8 percent--of the 213,606 trips their trucks made in 1962. Almost 93 percent of these backhauls were their own goods.

"Adequate service not available for needs" and "more economical" were the reasons expressed most often by management personnel for operating their own trucks.

"Operating problems" and "meeting various State vehicle size and weight laws" were the principal disadvantages or problems in operating their own trucks expressed by management.

Many of the cooperatives in this study need more detailed motortruck operating-cost record-keeping systems. Records were generally kept on a fleet basis, with no apparent way of measuring the performance of each truck in the fleet.

MOTORTRUCK OPERATING COSTS OF FARMER COOPERATIVES

by Thomas H. Camp
Transportation Branch
Management Services Division

The 9,294 farmer cooperatives in the United States owned or leased an estimated 33,000 motortrucks as of January 1, 1961, according to a recent study by Farmer Cooperative Service.[1] These motortrucks do an important part of the hauling of agricultural commodities and supplies for members and patrons of cooperatives.

This study was made in response to recommendations made to the Department of Agriculture by the Transportation and Storage Research Advisory Committee. It is the second phase of a study of motortruck operations and costs. These costs are needed to provide benchmarks for the guidance of cooperative managements in helping increase efficiency of operations and thereby increase returns to farmers.

A previous study by Farmer Cooperative Service provided a record of number, types, and sizes of motortrucks operated by farmer cooperatives. Of the 6,171 cooperatives participating in the previous study, 3,469 operated motortrucks. Only 128 of this number, however, operated fleets of 25 or more trucks.[2]

Of the 128 cooperatives operating 25 or more trucks, 28 stated that 50 percent or more of their total truck mileage was "over-the-road."[3]

These cooperatives were selected for detailed study to determine truck operating characteristics and costs for the larger fleet operators. We scheduled field interviews during 1963 and obtained usable motortruck operating cost information from 20 of the 28 cooperatives. This information is the basis of findings reported here.

Relationship of Truck Operating Costs to Total Transportation Expenditures

While this study pertains primarily to motortruck operating costs, related information on total transportation expenditures was obtained from 19 of the 20 cooperatives in the study. These cooperatives spent over $100 million on transportation in 1962 (table 1).

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[1] Bowser, William C. Motortruck Operations of Farmer Cooperatives, Gen. Rpt. 109, Farmer Cooperative Serv., U.S. Dept. Agr., Feb. 1963.

[2] The term "trucks" as used here and hereafter in this report refers only to power units.

[3] "Over-the-road" was defined in the questionnaire as hauls other than local pickup and delivery and movements from fields to local concentration points.

The table shows cooperatives rely heavily on for-hire motortruck and rail carriers for transportation services. Their own private truck operations accounted for only 12 percent of total transportation expenditures.

Table 1.--Total transportation expenditures by 19 farmer cooperatives, 1962

Item	Costs	Percentage of total
	Dollars	Percent
For-hire motortruck and rail	$86,250,993	86
Own trucks	12,411,364	12
Own barges	1,767,600	2
For-hire, other	204,000	(2)
Traffic management [1]	354,810	(2)
Total	100,988,767	100.0

[1] Salaries and other traffic department expenses reported separately by 8 cooperatives and not included in preceding items.

[2] Less than one-half of one percent.

Records kept by the 19 cooperatives did not permit a breakdown between transportation expenditures on for-hire motortruck and rail. Limited information obtained from 10 of the 19 cooperatives, however, indicated for-hire motortrucks accounted for about 12 percent of the $86,250,993 spent for both.

Number and Types of Motortrucks Operated

Motortruck operating cost data were obtained on 533 truck-tractors, 123 straight trucks, and 832 trailers and semitrailers operated by the 20 cooperatives in this study. Of these, 45 truck-tractors and 45 semitrailers and trailers were leased (table 2).

Thirty-nine percent (183) of the van-type semitrailers and trailers and about two-thirds (62) of the straight trucks were refrigerated. The majority of straight trucks were large 10-wheel units.

Table 2.--Number and types of motortrucks owned or leased by 20 cooperatives, 1962

Type	Owned	Leased	Total
Truck tractors	488	45	533
Straight trucks:			
Van	89	-	89
Tank	-	-	-
Other	34	-	34
Total power units	611	45	656
Semitrailers and trailers:			
Van	445	28	473
Tank	157	7	164
Other	185	10	195
Total semitrailers and trailers	787	45	832

Analysis of Motortruck Operating Costs

The motortruck operating costs shown here were obtained from the accounting records of the 20 cooperatives in the study. These cooperatives were located in 11 States--Virginia, North Carolina, New York, Kansas, Minnesota, Indiana, Idaho, Utah, Oregon, Missouri, and California. Analysis of data showed no appreciable differences in costs that could be related to geographic region of operation.

Since cost recordkeeping systems varied widely among cooperatives, we devised a motortruck cost schedule and obtained costs from each of the 20 cooperatives for the major cost groups in the schedule (appendix 1). Use of this schedule permitted comparative analysis of costs among cooperatives.

Total Operating Costs

The average total motortruck operating costs of the 20 cooperatives in the study are shown by major cost groups in table 3. Total operating costs per mile averaged 36 cents.

Table 3.--Total motortruck operating costs by major cost groups, 20 cooperatives, 1962

Cost groups	Costs		
	Amount	Per mile	Percentage of total
	Dollars	Cents	Percent
Direct costs[1]	$9,772,422	25.6	71.2
Overhead costs[2]	2,548,465	6.7	18.5
Indirect costs[3]	1,409,979	3.7	10.3
Total	13,730,866	36.0	100.0

[1] Costs directly chargeable to individual vehicles which vary directly with vehicle miles traveled and tonnage hauled.

[2] Costs directly chargeable to individual vehicles which do not vary with vehicle miles traveled and tonnage hauled.

[3] Certain specified general expenses for the cooperative as a whole, not directly chargeable to individual vehicles.

Direct costs accounted for over two-thirds of the almost $13 3/4 million spent by the cooperatives in operating their own trucks in 1962. A more detailed cost breakdown under the major cost headings is shown in appendix 2.

Direct Costs

Drivers' wages accounted for over half of the direct operating costs reported by the 20 cooperatives (table 4). The next largest item was fuel, oil, and grease, which amounted to almost one-fourth of the direct operating costs.

Based on detailed information obtained from cost records of 14 of the 20 cooperatives, vehicle repairs and parts accounted for 3.6 cents a mile, or about 83 percent of the costs included in "all other".

None of the cooperatives in this study had helpers accompany the drivers on trips.

Table 4.--Total direct costs by individual costs items, 20 cooperatives, 1962

Items	Costs		
	Amount	Per mile	Percentage of total
	Dollars	Cents	Percent
Drivers' wages[1]	$4,956,471	13.0	50.7
Fuel, oil, and grease	2,322,684	6.1	23.8
Tires and tubes (including repairs)	825,876	2.1	8.4
All other[2]	1,667,391	4.4	17.1
Total	9,772,422	25.6	100.0

[1] Includes social security, workmen's compensation taxes and insurance, and fringe benefits.

[2] Includes vehicle repairs and parts, over-the-road expenses of drivers, road services, and general maintenance.

Overhead Costs

Depreciation of motortrucks and facilities amounted to 55 percent of total overhead costs (table 5). Rates of depreciation varied among cooperatives, but they were generally computed on a straight-line basis. Taxes, licenses, and permits were the second largest item, accounting for over 21 percent of overhead costs.

Table 5.--Total overhead costs by individual cost items, 20 cooperatives, 1962

Items	Costs		
	Amount	Per mile	Percentage of total
	Dollars	Cents	Percent
Depreciation of motortrucks and facilities	$1,412,471	3.7	55.4
Taxes, licenses, and permits	537,850	1.4	21.1
Insurance	316,845	.8	12.4
Interest on investment	281,299	.8	11.1
Total	2,548,465	6.7	100.0

Interest on investment, which accounted for over 11 percent of overhead costs, was generally not included in records kept by many cooperatives in this study. If the cost figure was not available, it was computed at the rate the cooperative was currently paying on borrowed capital for such an investment.

Indirect Costs

Indirect costs amounted to over 10 percent of total operating costs (table 6). Office and garage salaries and wages was the largest item, amounting to almost 90 percent of indirect costs.

Table 6.--Total indirect costs by individual cost items, 20 cooperatives, 1962

Items	Costs		
	Amount	Per mile	Percentage of total
	Dollars	Cents	Percent
Office and garage salaries and wages[1]	$1,251,920	3.3	88.8
All other[2]	158,059	.4	11.2
Total	1,409,979	3.7	100.0

[1] Includes traffic and transportation management, other executive time spent in general administration of trucking and related social security, workmen's compensation taxes and insurance, and fringe benefits.

[2] Includes heat, light, water, telephone, office and garage equipment and supplies, office and garage rental, and miscellaneous expenses.

Fourteen of the 20 cooperatives in the study operated their own garage or shop facilities for most major motortruck repairs and overhauls. The remainder operated limited facilities for minor repairs or preventive maintenance purposes and had major repairs and overhauls performed in commercial garages.

Based on information obtained from 12 of the 20 cooperatives, heat, light, water, and telephone accounted for over half of "all other" expenses.

Distribution by Average Costs and Size of Truck Fleet

Table 7 shows the distribution of the 20 cooperatives by cost categories. Eleven cooperatives had motortruck operating costs that averaged between 30 and 39.9 cents a mile.

Table 7.--Distribution of 20 cooperatives by average motortruck operating costs, and size of truck fleet, 1962

Cents per mile	Number of cooperatives	Trucks operated	
		Total	Average per cooperative
		Number	Number
Under 30	4	69	17.3
30 - 39.9	11	422	38.4
40 - 49.9	3	129	43.0
50 and above	2	36	18.0
Total	20	656	32.8

Four cooperatives had average total operating costs of under 30 cents a mile while two had costs averaging 50 cents or more a mile. These two extremes in costs may be attributed to inadequate cost records or, in the case of those 50 cents a mile and above, to including specialized hauling equipment that represents a large investment and relatively low annual mileage.

The 11 cooperatives with average costs between 30 and 39.9 cents a mile operated almost two-thirds of the motortrucks studied.

The average size fleet operated by the 20 cooperatives was 32.8 trucks.

Motortruck Operations

The operating characteristics of the motortrucks operated by the 20 cooperatives are shown in table 8. Data shown demonstrate the relatively short-haul and pickup and delivery-type operation that characterizes truck operations of cooperatives in this study.

While the 656 trucks operated by the cooperatives traveled over 38 million miles in 1962, the average round trip, as reported by 18 cooperatives, was 178.4 miles. The large number of stopoffs per trip (6.1) indicates the motortrucks operated by these cooperatives are used primarily in delivery-type operations. Information provided by 13 of the 20 cooperatives showed their average load per trip to be 10.9 tons.

Table 8.--Motortruck operating statistics, 20 cooperatives, 1962

Item	Number
Total miles operated	38,113,902
Average annual miles per truck	58,100
Average length of round trip (miles)[1]	178.4
Average pickups per trip	1.9
Average stopoffs per trip	6.1
Average miles per gal. of fuel	5.5

[1] As reported by 18 cooperatives.

Average Length of Trip

The distribution of 18 cooperatives by average length of round trip taken by their trucks in 1962 is shown in table 9. Fourteen of the 18 cooperatives averaged trips of under 400 miles. Only one cooperative averaged 700 or more miles per trip. The average length of round trip was under 300 miles for over 70 percent of the trucks operated by the 18 cooperatives.

Table 9.--Distribution of 18 cooperatives by average length of truck round trip, 1962

Average length of round trip	Number of cooperatives	Number of trucks
Miles		
Under 100	3	236
100 - 199	3	56
200 - 299	5	159
300 - 399	3	85
400 - 499	0	0
500 - 599	1	53
600 - 699	2	31
700 and over	1	17
Total	18	637

Backhaul Characteristics

Detailed information was obtained from 18 of the 20 cooperatives regarding frequency and characteristics of backhauls in their own trucks. As shown in table 10, the 18 cooperatives had backhauls for only 46,627 trips, or 21.8 percent of the 213,606 trips their 603 trucks made in 1962. Of these backhauls almost 93 percent were the cooperatives' own goods.

Lack of backhaul tonnage is a limiting factor in cooperative truck operations as indicated here.

Table 10.--Number and percentage of total trips (213,606) for which 18 cooperatives had backhauls, by type of backhaul, 1962

Type of backhaul	Backhauls		
	Number	Percentage of total trips	Percentage of backhaul trips
Own goods	43,340	20.3	92.9
Goods of other cooperatives	2,751	1.3	5.9
Exempt agricultural commodities	130	(1)	.3
All other	406	0.2	.9
Total	46,627	21.8	100.0

[1] Less than one-tenth of one percent.

Reasons for Operating Own Trucks

Management personnel of the 20 cooperatives responsible for supervision of trucking operations were asked to list reasons for operating their own trucks. Table 11 lists the reasons in order of importance.

Economy, service, and flexibility were the reasons mentioned most often by cooperatives in this study for operating their own trucks. The number of times, "adequate service not available for needs," was mentioned indicates many of the cooperatives are operating trucks out of necessity.

Table 11.--Reasons for operating own trucks, as reported by 20 cooperatives, 1962

Reasons	Number of times reported
More economical	14
Adequate service not available for needs	14
Greater flexibility in operation	12
Better service to customers and patrons	10
Advertisement and better customer relations	3

Disadvantages in Operating Own Trucks

Operating problems such as utilizing operating personnel during slack periods, balancing available equipment with hauling needs and keeping equipment productively employed were the major disadvantages or problems reported by the 20 cooperatives (table 12). These were followed closely by problems of meeting various State vehicle size and weight laws in interstate trucking. Items of importance also are listed in table 12.

Table 12.--Disadvantages or problems in operating own trucks, as reported by 20 cooperatives, 1962

Disadvantages or problems	Number of times reported
Operating problems	11
Meeting various State vehicle size and weight laws	10
Large investment needed	3
No cost advantage over for-hire carriers	3
No disadvantages	3
Lack of backhauls	2
Administrative burden	2

Observations

The farmer cooperatives studied operate motortrucks to provide a type service that is evidently not readily available from for-hire carriers. They are used primarily for operations requiring multiple stops and flexibility in service.

Many of the cooperatives in this study need more detailed motortruck operating-cost record-keeping systems. Most of them maintained adequate fleet records on drivers' wages, fuel, repair, and other direct operating costs but often overlooked one or more overhead items such as interest on investment and administrative costs.

Few of the cooperatives kept separate performance records on individual trucks. Most records were on a fleet basis, with no apparent way of measuring the performance of each truck in the fleet.

There might be advantages in keeping some operating records on an individual truck basis. This would permit measurement of efficiency and productivity of each unit, thus aiding management in minimizing costs and increasing overall efficiency of the fleet.

Appendix I

Motortruck Transportation Cost Analysis Sheet

Year _____ to _____ 19____
(Capital Investment $_____)

Interest on Investment (Rate _____%) . . . . . $_____

Depreciation (Including carrying charges, if any):

Straight trucks, excluding tires (Number: _____) $_____
Tractors " " (Number: _____) $_____
Trailers " " (Number: _____) $_____
Refrigeration Units (Number: _____) $_____
Garage and shop
Garage and shop equipment (include replacement of lost and broken tools.)

Total Depreciation . . . . . $_____

Insurance, Taxes, Licenses:

Comprehensive insurance on vehicles $_____
Collision insurance $_____
Public Liability and Property Damage $_____
Cargo insurance $_____
Insurance on Garage and Equipment (Fire, theft, etc.) $_____
Personal property taxes (City, State, County)
Garage $_____
Trucks and Trailers $_____
License Tags and Inspections $_____
Registration Fees $_____
State Use Taxes (on gas, other fuels and oil) $_____

Total Insurance, Taxes, and Licenses . . . . . $_____

Utilities, Supplies, etc.:

Heat, Light, and Water $_____
Telephone $_____
Office Space Costs or Rental $_____
Office Equipment and Supplies $_____
Rent (Garage & shop if not owned) $_____
Garage supplies, work uniforms, laundry $_____
Special Equipment (tarpaulins, heaters, fire extinguishers) $_____
Sign work $_____
Other (_____) $_____
Other (_____) $_____

Total Utilities, Supplies, Etc. . . . . $_____

Salaries (other than drivers and helpers):

Supervision (Garage and shop - Number _____)		$ _____
Garage and shop employees	(Number _____)	$ _____
Traffic and Transportation Management	(Number _____)	$ _____
(Include executive time spent in general administration of trucking operations.)		
Office salaries and wages	(Number _____)	$ _____
Workman's compensation taxes and insurance		
Social security tax		$ _____
Fringe benefits:		
Health insurance and hospitalization		$ _____
Vacation and holiday pay		$ _____
Bonus		$ _____
Total Salaries (other than drivers and helpers)		$ _____

Operating Costs:

Fuel, Oil, and Grease (include filters)	$ _____
Tires and tubes (Costs or depreciation)	$ _____
Tire repair and recaps	$ _____
Vehicle repairs and parts (own shop)	$ _____
Repairs done outside of own shop (Including parts and labor)	$ _____
Road services	$ _____
Protective services (fuel for heaters or refrigeration units, icing, etc.)	$ _____
Washing	$ _____
Painting	$ _____
Antifreeze and tire chains	$ _____
Over-the-road expenses (driver and helper)	
Meals	$ _____
Lodging	$ _____
Bridge and turnpike tolls	$ _____
Fines	$ _____
Other (_____)	$ _____
Total Operating Costs	$ _____

Drivers' Wages:

Drivers' wages (Number: _____)	$ _____
Helpers' wages (Number: _____)	$ _____
Other driver expense (exclude meals, lodging, tolls, and fines)	$ _____
Workmens' compensation taxes and insurance	$ _____
Social Security Tax	$ _____
Fringe benefits:	
Health insurance and hospitalization	$ _____
Vacation and holiday pay	$ _____
Total Drivers' Wages	$ _____
GRAND TOTAL, TRUCK TRANSPORTATION COSTS	$ _____

Appendix II

Motortruck Operating Costs, 20 Cooperatives, 1962

Cost item	Costs			
	Amount	Per mile	Percent of group	Percent of total
	Dollars	Cents	Percent	Percent
Overhead				
Depreciation of motortrucks and facilities	$1,412,471	3.7	55.4	10.3
Taxes, licenses, and permits	537,850	1.4	21.1	3.9
Insurance	316,845	.8	12.4	2.3
Interest on investment	281,299	.8	11.1	2.0
Total	2,548,465	6.7	100.0	18.5
Direct				
Drivers' wages[1]	4,956,471	13.0	50.7	36.1
Fuel, oil, and grease	2,322,684	6.1	23.8	17.0
Tires and tubes (including repairs)	825,876	2.1	8.4	6.0
All other [2]	1,667,391	4.4	17.1	12.1
Total	9,772,422	25.6	100.0	71.2
Indirect				
Office and garage salaries and wages[3]	1,251,920	3.3	88.8	9.1
All other[4]	158,059	.4	11.2	1.2
Total	1,409,979	3.7	100.0	10.3
Grand total	13,730,866	36.0		100.0

[1] Includes social security, workmen's compensation taxes and insurance, and fringe benefits.
[2] Includes vehicle repairs and parts, over the road expenses of drivers, road services, and general maintenance.
[3] Includes traffic and transportation management and other executive time spent in general administration.
[4] Includes heat, light, water, telephone, office, and garage equipment and supplies, office and garage rental, and miscellaneous expenses.

Other Publications Available

Motortruck Operations of Farmer Cooperatives, General Report 109. William C. Bowser, Jr.

Piggyback Transportation for Pacific Northwest Cooperatives, General Report 86. William C. Bowser, Jr.

Losses of Livestock in Transit in Midwestern and Western States, Marketing Research Report 247. Joseph E. Rickenbacker

Safety-Checking Livestock Trucking To Reduce Loss and Damage, Information 33. Joseph E. Rickenbacker

Safety-Checking Handling Facilities To Reduce Livestock Losses, Information 28. Joseph E. Rickenbacker

Motortruck Leasing by Farmer Cooperatives, Information 14. William C. Bowser, Jr.

A copy of each of these publications may be obtained upon request while a supply is available from--

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